

What is claimed is:

1. A valve for a gas-driven motor comprising:

a shiftable valve for alternatively supplying a motive gas through first and second supply ports to opposed first and second power pistons in opposed motive gas chambers, respectively, and for effecting alternating exhaust of said chambers;

the shiftable valve having a front face with a valve projection located thereon, and a rear face with a valve projection located thereon.

2. The valve according to claim 1, wherein the valve projections are chamfered.

3. The valve according to claim 1, wherein the shiftable valve is a spool valve having a large diameter end on which the front face is located and a small diameter end on which the rear face is located.

4. The valve according to claim 3, wherein the large and small diameter ends further comprise annular grooves having seals disposed therein.

5. A valve assembly for a gas-driven motor comprising:

a shiftable valve for alternatively supplying a motive gas through first and second supply ports to opposed first and second power pistons in opposed motive gas chambers, respectively, and for effecting alternating exhaust of said chambers;

the shiftable valve having a longitudinal axis and a front face with a valve projection located thereon, and a rear face with a valve projection located thereon, the valve projections being coaxially aligned along the longitudinal axis;

a valve block having a chamber with a front end and a rear end disposed around the shiftable valve and permitting axial movement of the shiftable valve along its longitudinal axis, wherein the front face of the shiftable valve is located in the front end of the chamber and the rear face of the shiftable valve is in the rear end of the chamber; the valve block further comprising

inner exhaust passages in fluid communication with the front and rear ends of the chamber,

outer exhaust passages corresponding to and in fluid communication with each of the inner exhaust passages, and

constricted regions between the inner and outer exhaust passages, the constricted regions configured to define valve seats into which the valve projections mate, such that upon reciprocating movement of the shiftable valve along the longitudinal axis, the inner exhaust passageways are alternately opened to their corresponding outer exhaust passageways.

6. The valve assembly according to claim 5, wherein the valve projections are chamfered.
7. The valve assembly according to claim 5, wherein the shiftable valve is a spool valve having a large diameter end on which the front face is located and a small diameter end on which the rear face is located.
8. The valve assembly according to claim 7, wherein the large and small diameter ends further comprise annular grooves having seals disposed therein.
9. The valve assembly according to claim 8, further comprising a valve insert disposed in

an annular groove on the spool valve between the large and small diameter ends, the valve insert moves reciprocally with the shiftable valve to alternately connect the first and second supply ports to a motive gas supply.

10. The valve assembly according to claim 7, wherein the valve block further comprises an O-ring disposed to fit circumferentially around the valve projection on the front face.

11. A reciprocating pump comprising:

a gas-driven motor having

opposed first and second power pistons in opposed first and second motive gas chambers;

a shiftable valve for alternatively supplying a motive gas through first and second supply ports to the opposed first and second power pistons in the opposed first and second motive gas chambers, respectively, and for effecting alternating exhaust of the chambers;

the shiftable valve having a longitudinal axis and a front face with a valve projection located thereon, and a rear face with a valve projection located thereon, the valve projections being coaxially aligned along the longitudinal axis;

a valve block having a chamber with a front end and a rear end disposed around the shiftable valve and permitting axial movement of the shiftable valve along its longitudinal axis, wherein the front face of the shiftable valve is located in the front end of the chamber and the rear face of the shiftable valve is in the rear end of the chamber; the valve block further comprising

a first inner exhaust passage in fluid communication with the front end of the chamber and an exhaust chamber, a first outer exhaust passage in fluid communication

with the first inner exhaust passage and the first motive gas chamber, and a first constricted region between the first inner and first outer exhaust passages; and

a second inner exhaust passage in fluid communication with the rear end of the chamber and the exhaust chamber, a second outer exhaust passage in fluid communication with the second inner exhaust passage and the second motive gas chamber, and a second constricted region between the second inner and second outer exhaust passages;

the first and second constricted regions being configured to define valve seats into which the valve projections of their respective front and rear ends mate, such that upon reciprocating movement of the shiftable valve along the longitudinal axis, the inner exhaust passageways are alternately opened to their corresponding outer exhaust passageways.

12. The reciprocating pump according to claim 11, wherein the valve projections are chamfered.

13. The reciprocating pump according to claim 11, wherein the shiftable valve is a spool valve having a large diameter end on which the front face is located and a small diameter end on which the rear face is located.

14. The reciprocating pump according to claim 13, wherein the large and small diameter ends further comprise annular grooves having seals disposed therein.

15. The reciprocating pump according to claim 13, further comprising a valve insert disposed in an annular groove on the spool valve between the large and small diameter ends, the valve insert moves reciprocally with the shiftable valve to alternately connect the first and second supply ports to a motive gas supply.

16. The reciprocating pump according to claim 11, wherein the valve block further comprises an O-ring disposed to fit circumferentially around the valve projection on the front face.

17. The reciprocating pump according to claim 11, wherein the pump is a double-diaphragm pump.